



0000-0000-0007-3540

Document Control Sheet

Sheet Title:	AIR NSR 1 YD
Box ID:	5964
Control Sheet ID:	0000-0000-0007-3540
Record Series Name:	AIR / New Source Review Permit
Record Series:	AIR NSR
Primary ID:	100788959
Secondary ID:	7711A
Doc Type:	Permits
Security:	Public
Date:	4/10/2018
Title:	Working File Folder
Tertiary ID	281361

[Return to Sharenet](#)**04/02/2018 -----NSR IMS - PROJECT RECORD -----****PROJECT#:** 281361 **STATUS:** PENDING**PROJECT ADMIN NAME:** BAGHOUSE REPLACEMENT AND RELOCATION PROJECT**PROJECT TECH NAME:** ASPHALT ROOFING MANUFACTURING FACILITY**PROJECT ACTIONS**

Permit	Action Type	Permit Type	Received Date	Permit Status	Renewal Date	Action Status	Complete Date
7711A	REVISION	CONSTRUCT	02/08/2018	EFFECTIVE	11/25/2024	PENDING	4/10/18

Assigned Team: MECHANICAL TEAM**STAFF ASSIGNED TO PROJECT:**

HARVILLE, JENNIFER

- REVIEWR1_2 -

AP INITIAL REVIEW

STUMP, STEVEN

- REVIEW ENG -

MECHANICAL TEAM

COMPANY INFORMATION

Issued To	Company Name	Customer Reference Number
BUILDING MATERIALS INVESTMENT CORPORATION	Building Materials Investment Corporation	CN605251487

- CONTACT INFORMATION

Contact Type	Name	Title	Organization Name
RESPONSIBLE OFFICIAL	MR BRUCE DAHLGREN	PLANT MANAGER	BUILDING MATERIALS INVESTMENT CORPORATION

Phone	FAX	Address
(214) 637-8970	(214) 637-5202	2600 SINGLETON BLVD, DALLAS, TX, 75212-3738

EMAIL: BRUCE.DAHLGREN@GAF.COM

Contact Type	Name	Title	Organization Name
TECHNICAL CONTACT	MR KEVIN BUSH	SR ENVIRONMENTAL ENGINEER	BUILDING MATERIALS INVESTMENT CORPORATION

Phone	FAX	Address
(972) 872-2325	(214) 637-5202	2600 SINGLETON BLVD, DALLAS, TX, 75212-3738

EMAIL: KEVIN.BUSH@GAF.COM**PERMIT INFORMATION****REGULATED ENTITY NUMBER: RN100788959****RECEIVED****MAY 09 2018****TCEQ
CENTRAL FILE ROOM**

Permit	Account	Permittee Name	County	Region	City	State	Location
7711A	DB0378S	GAF MATERIALS	DALLAS	REGION 04 - DFW METROPLEX	DALLAS	TEXAS	2600 SINGLETON BLVD DALLAS TX 75212

- PERMIT AFFILIATION:

Permit1	Related Permit 2	Relationship Type	Start Date
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PROJECT NOTES:

02/13/2018 SOS 02/13/2018 NO APWL DFC

- PERMIT NOTES:

12/09/2009 INCORPORATE STANDARD PERMIT NO. 91414 AT NEXT AMEND. OR RENEWAL

06/15/2017 AS REFERENCED IN 30 TAC § 116.116(D)(2), ALL CHANGES AUTHORIZED UNDER PBR 147140 TO A PERMITTED FACILITY SHALL BE INCORPORATED INTO THE NSR PERMIT NO. 7711A WHEN IT IS AMENDED OR RENEWED.

- TRACKING ELEMENTS:

TE Name	Start Date	Complete Date
APIRT RECEIVED PROJECT (DATE)	02/08/2018	
APIRT TRANSFERRED PROJECT TO TECHNICAL STAFF (DATE)	02/13/2018	
COMPLIANCE HISTORY REVIEW COMPLETED (DATE)	02/14/2018	
PROJECT RECEIVED BY ENGINEER (DATE)	02/14/2018	
PROJECT RECEIVED BY TECHNICAL STAFF FROM APIRT (DATE)	02/14/2018	
WORKING DRAFT PERMIT REVIEW CYCLE	03/27/2018	03/28/2018
FINAL PACKAGE TO SECTION MANAGER FOR REVIEW (DATE)	04/02/2018	
FINAL PACKAGE TO TEAM LEADER OR SUPERVISOR FOR REVIEW (DATE)	04/02/2018	
CENTRAL REGISTRY UPDATED		
ENHANCED ADMINISTRATIVE OR APPLICATIONS REVIEW (EAR)		

UNIT TYPES:**- Permit Unit Type:**

Industry Group	Industry Type	Source Type	Control/BACT Type	Start Date	End Date
MECHANICAL	ASPHALT ROOFING			01/26/2009	

Permit Alteration Source Analysis & Technical Review

Company	Building Materials Investment Corporation	Permit Number	7711A
City	Dallas	Project Number	281361
County	Dallas	Regulated Entity Number	RN100788959
Project Type	Revision	Customer Reference Number	CN605251487
Project Reviewer	Steven Stump		
Site Name	Asphalt Roofing Manufacturing Facility		

Project Overview

Building Materials Investment Corporation requested an alteration of their permit which authorizes an asphalt roofing production facility. With this alteration, the company requests to replace the current Sand Application Baghouse (Emission Point Number [EPN] 25) with a new baghouse and relocate the baghouse stack to a new location further away from the nearest property line. Changes in permit conditions are not required by the proposed project. The new baghouse will have improved pollution control performance with an outlet grain loading of 0.002 grains per dry standard cubic feet (gr/dscf) that results in lower potential emissions and the Maximum Allowable Emission Rates Table must be revised with the new emissions.

Emission Summary

Air Contaminant	Current Allowable Emission Rates (tpy)	Proposed Allowable Emission Rates (tpy)	Change in Allowable Emission Rates (tpy)
PM	104.47	100.48	-3.99
PM ₁₀	104.47	100.48	-3.99
PM _{2.5}	104.47	100.48	-3.99
VOC	47.90	47.90	0.00
NO _x	19.13	19.13	0.00
CO	66.97	66.97	0.00
SO ₂	128.69	128.69	0.00
HAPs	<25.00	<25.00	0.00

Impacts Evaluation - 30 TAC 116.111(a)(2)(J)

Was modeling conducted?	Yes	Type of Modeling:	Screen3
Will GLC of any air contaminant cause violation of NAAQS?			No
Is this a sensitive location with respect to nuisance?			Moderate
[§116.111(a)(2)(A)(ii)] Is the site within 3000 feet of any school?			Yes
Additional site/land use information: The surrounding area is a mix of residential and industrial. The closest receptor is a business located 250 feet away. The closest property line is 200 feet away. There are three schools nearby, a middle school located 1,600 feet away, a high school 2,500 feet away, and an elementary school 2,900 feet away.			

Summary of Modeling Results

The modeled 1-hour GLC_{max} concentration at the property line for the current location of EPN 25 is 22.46 micrograms per cubic meters (µg/m³).
The modeled 1-hour GLC_{max} concentration at the property line for the proposed relocation of EPN 25 is 13.45 micrograms per cubic meters (µg/m³). The relocation of EPN 25 is expected to result in a decrease in impacts at the property line.

Permit Concurrence and Related Authorization Actions

Is the applicant in agreement with special conditions?	Yes
Company representative(s):	Ms. Latha Kambham, Trinity Consultants
Contacted Via:	e-mail

**Permit Alteration
Source Analysis & Technical Review**

Permit No. 7711A
Page 2

Regulated Entity No. RN100788959

Date of contact:

March 27, 2018

Other permit(s) or permits by rule affected by this action:

No

List permit and/or PBR number(s) and actions required or taken:

N/A



4/2/2018

Project Reviewer
Steven Stump

Date



Team Leader
Bonnie Evridge

4/6/2018

Date



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Consultants

AIR PERMITS DIVISION

February 7, 2018

Air Permits Initial Review Team (APIRT)
Texas Commission on Environmental Quality
12100 Park 35 Circle, MC 161
Building C, Third Floor, Room 300W
Austin, TX 78753



FEB 08 2018

RECEIVED

Re: *New Source Review (NSR) Permit Alteration Request – Baghouse Replacement and Relocation Project*
NSR Permit No. 7711A
Building Materials Investment Corporation – Dallas Plant – Dallas, TX, Dallas County
Customer Reference Number (CN) 605251487
Regulated Entity Reference Number (RN) 100788959

Dear APIRT:

Building Materials Investment Corporation doing business as GAF Materials Corporation (GAF) owns and operates an asphalt roofing production facility located in Dallas, Texas (Dallas Plant). Operations at GAF Dallas Plant are authorized under New Source Review (NSR) Permit No. 7711A, Standard Permit No. 91414 and several Permits by Rule (PBRs). The Dallas Plant is a Title V facility operating under Site Operating Permit (SOP) No. O-2771.

In Asphalt Roofing Line 3 at the Dallas Plant, a dry non-woven fiberglass mat is fed into the roofing machine from an unwind stand. A mechanical splicer and an accumulator are provided so that the rolls can be fed in sequence by splicing without interruption of the operation. The unwind stand and the accumulator are controlled by the Sand Application Baghouse (Emission Point Number [EPN] 25). With this submittal, GAF proposes following changes to the baghouse (EPN 25):

- Replace the current baghouse with a new baghouse that will result in lower potential emissions than the currently permitted emissions; and
- Relocate the baghouse stack to a new location further way from the nearest property line. Figure 1 below shows the locations of the existing stack and the new stack locations, as well as the nearest property line.

HEADQUARTERS >

12700 Park Central Drive | Suite 2100 | Dallas, TX 75251 | P (972) 661-8100 | F (972) 385-9203

North America | Europe | Middle East | Asia

Figure 1. Existing and Proposed Locations of the Sand Application Baghouse Stack



As shown in the emissions calculations in Attachment 1, the project will result in a decrease in allowable emissions of particulate matter (PM), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), and particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) from the Sand Application Baghouse (EPN 25). The proposed emissions and stack parameter information for the new baghouse are summarized on the Table 1(a) in Attachment 2.

The requirements for authorization of the proposed project through permit alteration are addressed below. The permit alteration requirements found in Title 30 of the Texas Administrative Code (30 TAC) §116.116(c) are included in *italics*.

COMPLIANCE WITH 30 TAC §116.116(C)

- 116.116(c)(1) *A permit alteration is:*
- (A) a decrease in allowable emissions; or*
 - (B) any change from a representation in an application, general condition, or special condition in a permit that does not cause:*
 - (i) a change in the method of control of emissions;*
 - (ii) a change in the character of emissions; or*
 - (iii) an increase in the emission rate of any air contaminant.*

As shown in the emissions calculations in Attachment 1, the proposed project will result in a decrease in allowable PM, PM_{10} and $PM_{2.5}$ emissions from the Sand Application Baghouse (EPN 25). The proposed project is not a change in the method of control of emissions. There will be no change in the character of emissions or increase in the emission rate of any contaminant.

- 116.116(c)(2) *Requests for permit alterations that must receive prior approval by the executive director are those that:*

- (A) result in an increase in off-property concentrations of air contaminants;*
- (B) involve a change in permit conditions; or*
- (C) affect facility or control equipment performance.*

A screening analysis was conducted using unit emission rate of one pound per hour (lb/hr) to assess the off-property impacts of the proposed project. The SCREEN3 input table and outputs are included in Attachment 3. As shown in Attachment 3, the maximum ground level concentration (GLC_{max}) reduces as result of the proposed project. Therefore, the proposed project will not result in an increase in off-property concentration of air contaminants.

Changes in permit conditions are not required by the proposed project. The new baghouse will have improved pollution control performance with an outlet grain loading of 0.002 grains per dry standard cubic feet (gr/dscf) that results in lower potential emissions and the Maximum Emission Rates Table must be revised with the new emissions. As such, GAF is submitting this letter to request prior approval by the executive director for the proposed project.

- 116.116(c)(3) *The executive director shall be notified in writing of all other permit alterations not specified in paragraph (2) of this subsection.*

As stated above, in accordance with 30 TAC §116.116(c)(2), prior approval is required for this permit alteration request. Therefore, 30 TAC §116.116(c)(3) does not apply.

- 116.116(c)(4) *A request for permit alteration shall include information sufficient to demonstrate that the change does not interfere with the owner or operator's previous demonstrations of compliance with the requirements of §116.111(a)(2)(C) of this title.*

The new baghouse has better pollution control performance than the existing baghouse and will result in lower potential and actual emissions due to lower outlet grain loading of the new baghouse. Therefore, the proposed project will not interfere with previous demonstrations of compliance with 30 TAC §116.111(a)(2)(C), *Best Available Control Technology*.

- 116.116(c)(5) *Permit alterations are not subject to the requirements of §116.111(a)(2)(C) of this title.*

GAF understands that permit alterations are not subject to the requirements of 30 TAC §116.111(a)(2)(C), *Best Available Control Technology*.

If you have any questions regarding this submittal, please feel free to contact me at (972) 661-8100 or via email at lkambham@trinityconsultants.com, or Mr. Kevin Bush, GAF, at (214) 637-8933.

Sincerely,

TRINITY CONSULTANTS



Latha Kambham, Ph.D.
Managing Consultant

APIRT-TCEQ – Page 4
February 7, 2018

cc: Ms. Elizabeth Smith, Air Section Manager, TCEQ Region 4
Ms. Joni Keach, Section Manager, City of Dallas Air Pollution Control Program
Mr. Kevin Bush, GAF
Ms. Lele Bao, Trinity Consultants

Attachments

Special Conditions

Permit Number 7711A

Emission Limitations

1. This permit authorizes those sources of emissions listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and those sources are limited to the emission rates and other conditions specified in the table. In addition, this permit authorizes all emissions from planned startup and shutdown activities associated with facilities or groups of facilities that are authorized by this permit.

Fuel Specifications

2. Fuel for the facilities shall be pipeline-quality natural gas. Use of any other fuel will require prior approval of the Executive Director of the Texas Commission on Environmental Quality (TCEQ).
3. Upon request by the Executive Director of the TCEQ, the TCEQ Regional Director, or any local air pollution control program having jurisdiction, the holder of this permit shall provide a sample and/or an analysis of the fuel utilized in these facilities or shall allow air pollution control program representatives to obtain a sample for analysis.

Federal Applicability

4. These facilities shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources in Title 40 Code of Federal Regulations (40 CFR) Part 60, specifically the following:
 - A. Subpart A - General Provisions;
 - B. Subpart Dc - Small Industrial-Commercial- Institutional Steam Generating Units; and
 - C. Subpart UU - Asphalt Processing and Asphalt Roof Manufacture.
5. These facilities shall comply with all applicable requirements of the EPA regulations on National Emission Standards for Hazardous Air Pollutants for Source Categories in 40 CFR Part 63, specifically the following:
 - A. Subpart A - General Provisions; and
 - B. Subpart AAAAAAA - Area Sources: Asphalt Processing and Asphalt Roof Manufacturing.

Opacity/Visible Emission Limitations

6. Opacity of particulate matter emissions from the Coalescing Filter Mist Systems (Emission Point No. [EPN] CFL/34), the Electrostatic Precipitator (EPN CFL/34) (when used as a back-up control device for the filter mist systems), dust collector stacks, baghouse stacks,

process heater vents, and building vents shall not exceed 5 percent, averaged over a six-minute period.

7. Opacity of particulate matter emissions from any asphalt storage tank exhaust gases discharged into the atmosphere shall not exceed 0 percent, averaged over a six-minute period, except for one consecutive 15-minute period in any 24-hour period when the transfer lines are being blown for clearing. The control device shall not be bypassed during this 15-minute period. Opacity of particulate matter emissions from any blowing still shall not exceed 0 percent, averaged over a six-minute period.
8. Opacity of emissions from any storage silo and mineral handling facility shall not exceed 1 percent, averaged over a six minute period.
9. No visible fugitive emissions from the asphalt processing and asphalt roofing manufacturing operations and facilities, roads, or travel areas shall leave the property.

Operational Limitations, Work Practices, and Plant Design

10. The emissions from Stillyard Asphalt Storage Tank Nos. T-1, T-2, T-8, T-9, T-10, T-14, T-15, T-110, and T-120; from Blowing Stills T-13 and T-26; from truck and railcar loading and unloading operations; and from the self-seal asphalt storage tank shall be vented to the thermal oxidizer (direct-flame incinerator).
11. Fabric filter baghouses, properly installed and in good working order, shall control particulate matter emissions from the Stabilizer Storages, Stabilizer Heaters, the Line 1 Stabilizer and Heater, the Line 1 Stabilizer Use Bin, and Sand Application when this equipment is in operation.
12. Dust collectors, properly installed and in good working order, shall control particulate matter emissions from the Line 1 Surfacing Section when this equipment is in operation.
13. The thermal oxidizer (direct-flame incinerator) shall be operated at an average incineration temperature of 1450°F measured immediately downstream of the incinerator, based on a one-hour averaging period, during normal operations. Normal operations are herein defined as any time period when asphalt blowing is occurring, and emissions from the blowing are vented to the direct-flame incinerator. The direct-flame incinerator shall be operated at a minimum incineration temperature of 1300°F during Standby Operating Conditions to assure compliance with the maximum allowable emission rates table (MAERT) limits for volatile organic compounds (VOC) from EPN 8/8A. Standby operating conditions are herein defined as when no process blowers are in operation on any blowing still venting to the direct-flame incinerator.

The permit holder is allowed to conduct stack sampling of the thermal oxidizer (direct-flame incinerator) during normal operations at an average temperature lower than 1450°F to demonstrate compliance with the MAERT limits for VOC from EPN 8/8A. Upon demonstration of compliance with the MAERT limits for VOC, the permit holder shall submit a permit action to modify the temperature requirement of the thermal oxidizer (direct-flame incinerator) during Normal Operations.

14. The maximum allowable asphalt throughput rates are 32,063 pounds per hour for Line 1 and 53,438 pounds per hour for Line 3.
15. The maximum allowable production rates for both Line 1 and Line 3, combined, are 171 tons per hour and 1,498,000 tons per year of finished shingles.
16. An opacity violation or an odor nuisance condition, as confirmed by the TCEQ or any local air pollution control program with jurisdiction, may be cause for additional controls. If the nuisance condition persists, subsequent stack sampling may also be required.
17. All in-plant roads and areas subject to road vehicle traffic shall be paved with a cohesive hard surface and cleaned, as necessary, to maintain compliance with the TCEQ rules and regulations. Unpaved work areas shall be sprayed with water and/or environmentally sensitive chemicals upon detection of visible PM emissions to maintain compliance with all TCEQ rules and regulations.
18. All stacks associated with the Line 1 Cooling Section (EPN COOL1) shall be no less than 64 feet measured from ground level. All stacks associated with the Line 3 Cooling Section (EPN COOL3) shall be no less than 73 feet measured from ground level.
19. There shall be no changes in representations unless the permit is altered or amended.
20. The following facilities are authorized by separate Standard Permit:

Table 1: Standard Permit References

EPN/ Source Name	Registration No.
NST-1/Baghouse 1 (Filler Transfer Operations)- L3	91414
NST-1/Baghouse 2 (Filler Transfer Operations)- L3	91414

Demonstration of Continuous Compliance

21. Upon request by the TCEQ Executive Director or the TCEQ Regional Director having jurisdiction, the holder of this permit shall perform stack sampling and/or other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere to demonstrate compliance with the MAERT and with emission performance levels as specified in the special conditions and/or otherwise prove satisfactory equipment performance. Sampling must be conducted in accordance with the TCEQ *Sampling Procedures Manual* and in accordance with the applicable EPA 40 CFR procedures. Any deviations from those procedures must be approved by the TCEQ Executive Director or the appropriate TCEQ Regional Director prior to conducting sampling.
22. All stack sampling shall be conducted within 60 days of being informed that testing is required, and it shall meet all requirements specified in the Sampling Requirements section of this permit's special conditions.

23. The holder of this permit shall conduct a quarterly visible emissions determination to demonstrate compliance with the opacity limitations specified in this permit for Coalescing Filter Mist Systems Stack (EPN CFL/34), the Electrostatic Precipitator Stack (EPN CFL/34) (when used as a back-up control device for the filter mist systems), dust collector stacks, baghouse stacks, process heater vents, and building vents. This visible emissions determination shall be performed: 1) during normal plant operations, 2) for a minimum of six minutes, 3) approximately perpendicular to plume direction, 4) with the sun behind the observer (to the extent practicable), and 5) at least two stack heights, but not more than five stack heights, from the emission point. If visible emissions are observed from the emission point, the owner or operator shall:
 - A. Take immediate action to eliminate visible emissions, record the corrective action within 24 hours, and comply with any applicable requirements in 30 Texas Administrative Code (TAC) § 101.201, Emissions Event Reporting and Record Keeping Requirements; or
 - B. Determine opacity using 40 CFR Part 60, Appendix A, Test Method 9. If the opacity limit is exceeded, take immediate action (as appropriate) to reduce opacity to within the permitted limit, record the corrective action within 24 hours, and comply with applicable requirements in 30 TAC § 101.201, Emissions Event Reporting and Record Keeping Requirements.
24. The holder of this permit shall conduct a quarterly visible emissions determination to demonstrate compliance with the visible emissions limitation specified in this permit. This visible emissions determination shall be performed: 1) during normal plant operations, 2) for a minimum of six minutes, 3) approximately perpendicular to plume direction, 4) with the sun behind the observer (to the extent practicable), 5) at least 15 feet, but not more than 0.25 mile, from the plume, and 6) in accordance with EPA 40 CFR Part 60, Appendix A, Test Method 22, except where stated otherwise in this condition. If visible emissions exceed 30 cumulative seconds in any six-minute period, the owner or operator shall take immediate action (as appropriate) to eliminate the excessive visible emissions. The corrective action shall be documented within 24 business hours of completion.
25. For any asphalt storage tank, storage silo, or mineral handling facility, visible emissions observations shall be made and recorded once per week. Note that to properly determine the presence of visible emissions, all sources must be in clear view of the observer. The observer shall be at least 15 feet, but not more than 0.25 mile, away from the emission source during the observation. The observer shall select a position where the sun is not directly in the observer's eyes. If the observations cannot be conducted due to weather conditions, the date, time, and specific weather conditions shall be recorded. When condensed water vapor is present within the plume, as it emerges from the emissions outlet, observations must be made beyond the point in the plume at which condensed water vapor is no longer visible. When water vapor within the plume condenses and becomes visible at a distance from the emissions outlet, the observation shall be evaluated at the outlet prior to condensation of water vapor. If visible emissions are observed, the permit holder shall report a deviation. As an alternative, the permit holder may determine the opacity consistent with Test Method 9, as soon as practicable, but no later than 24 hours after observing visible emissions. If the result of the Test Method 9 is opacity above the corresponding opacity limit, the permit holder shall report a deviation.

26. For any blowing still, visible emissions observations shall be made and recorded once per week. Note that to properly determine the presence of visible emissions, all sources must be in clear view of the observer. The observer shall be at least 15 feet, but not more than 0.25 mile, away from the emission source during the observation. The observer shall select a position where the sun is not directly in the observer's eyes. If the observations cannot be conducted due to weather conditions, the date, time, and specific weather conditions shall be recorded. When condensed water vapor is present within the plume, as it emerges from the emissions outlet, observations must be made beyond the point in the plume at which condensed water vapor is no longer visible. When water vapor within the plume condenses and becomes visible at a distance from the emissions outlet, the observation shall be evaluated at the outlet prior to condensation of water vapor. If visible emissions are observed, the permit holder shall report a deviation. As an alternative, the permit holder may determine the opacity consistent with Test Method 9, as soon as practicable, but no later than 24 hours after observing visible emissions. If a Test Method 9 is performed, the opacity limit is the corresponding opacity limit associated with the particulate matter standard in the underlying requirement. If there is no corresponding opacity limit in the underlying applicable requirement, the maximum opacity will be established using the most recent performance test. If the result of the Test Method 9 is opacity above the corresponding opacity limit (associated with the particulate matter standard in the underlying applicable requirement or as identified as a result of a previous performance test to establish the maximum opacity limit), the permit holder shall report a deviation.

Compliance Assurance Monitoring

27. The temperature in the combustion chamber or immediately downstream of the combustion chamber of the thermal oxidizer (direct-flame incinerator) shall be measured and recorded four times per hour with an averaging period of one hour. The permit holder shall establish a minimum combustion temperature using the most recent performance test, manufacturer's recommendations, engineering calculations, and/or historical data. The monitoring instrumentation shall be maintained, calibrated, and operated in accordance with manufacturer's specifications or other written procedures. Any monitoring data below the minimum limit shall be considered and reported as a deviation.
28. The 3-hour average inlet gas temperature for the Coalescing Filter Mist Elimination Systems (Line 1 and Line 3 Asphalt Coaters) with ESP as Backup (EPN CFL/34) shall be maintained within the operating range established as specified in 40 CFR § 63.11562(a)(2) and (b)(3). The 3-hour average pressure drop across the device shall be maintained within the approved operating range established as specified in 40 CFR § 63.11562(a)(2) and (b)(3).

Sampling Requirements

29. The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at their own expense. Sampling ports and platforms shall be incorporated into the design of the stack(s) according to the specifications set forth in the attachment entitled "Chapter 2, Stack Sampling Facilities" prior to stack sampling. Alternate sampling facility designs may be submitted for approval by the TCEQ Regional Office with jurisdiction.

30. The plant shall operate at the maximum shingle production and raw material throughput rates and operating parameters, represented in the confidential file, during stack emissions testing being conducted for continuing compliance demonstrations. If the plant is unable to operate at the maximum rates during compliance testing, then the production/throughput rates or other parameters may be limited to the rates established during testing. If stack testing was not accomplished at the maximum production/throughput rates, then such testing may be required prior to actual operations at the maximum rates.
31. A pretest meeting shall be held with personnel from the TCEQ before the required tests are performed. The TCEQ Regional Office with jurisdiction shall be notified not less than 45 days prior to sampling to schedule a pretest meeting. The notice shall include:
 - A. Date for pretest meeting;
 - B. Date sampling will occur;
 - C. Points or sources to be sampled;
 - D. Name of firm conducting sampling;
 - E. Type of sampling equipment to be used; and
 - F. Method or procedure to be used in sampling.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test results.

32. Air contaminants to be tested for may include (but are not limited to) PM, CO, SO₂, NO_x, and VOC.
33. Alternate sampling methods and representative unit testing may be proposed by the permit holder. A written proposed description of any deviation from sampling procedures or emission sources specified in permit conditions or TCEQ or EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. Such a proposal must be approved by the TCEQ Regional Office with jurisdiction at least two weeks prior to sampling.
34. Requests to waive testing for any pollutant specified in the above special conditions shall be submitted to the TCEQ Office of Air, Air Permits Division in Austin.
35. The sampling report shall include the following:
 - A. Plant production and throughput rates during tests; and
 - B. Thermal oxidizer (direct-flame incinerator) operating temperature during tests.
36. Copies of the final sampling report shall be forwarded to the TCEQ within 30 days after sampling is completed. Sampling reports shall comply with the attached provisions of Chapter 14 of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

One copy to the TCEQ Regional Office with jurisdiction.

One copy to the TCEQ Office of Air, Air Permits Division in Austin.

One copy to each appropriate local air pollution control program with jurisdiction.

Recordkeeping Requirements

37. Records shall be maintained at this facility site and made available at the request of personnel from the TCEQ or any other air pollution control program having jurisdiction to demonstrate compliance with permit limitations. These records shall be totaled for each calendar month, retained for a rolling 60-month period, and include the following:
- A. Records of the exhaust gas temperature immediately downstream of the thermal oxidizer (direct-flame incinerator) to demonstrate compliance with 30 TAC § 115.126(1)(A)(i);
 - B. Records of either VOC concentration or mass emission rate of each vent gas stream for the Line 1 and Line 3 Cooling Sections at maximum actual operating conditions to demonstrate compliance with 30 TAC § 115.126(4);
 - C. Hourly asphalt throughput rates for Line 1 and for Line 3;
 - D. Combined Line 1 and Line 3 hourly and annual production rates of finished shingles;
 - E. Records of asphalt stored and used, that have the potential to emit Hazardous Air Pollutants (HAPs), kept in sufficient detail in order to allow all required emission rates to be fully and accurately calculated. Using this recorded data, a report shall be produced for the emission of HAPs (in tons per year) over the previous 12 consecutive months;
 - F. All malfunctions, repairs, and maintenance of abatement systems, which includes bag replacement and the manufacturer's suggested cleaning and maintenance schedule;
 - G. Quarterly observations for visible emissions and/or opacity determinations;
 - H. Records of road cleaning, application of road dust control, or road maintenance for dust control; and
 - I. All monitoring data and support information as specified in 30 TAC § 122.144.

Dated: November 25, 2014

Emission Sources - Maximum Allowable Emission Rates

Permit Number 7711A

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
Stillyard Operation				
HTR3	T-1 Laminating Adhesive Bulk Storage Tank Heater Vent	NO _x	0.05	0.22
		SO ₂	0.01	0.01
		PM	0.01	0.02
		PM ₁₀	0.01	0.02
		PM _{2.5}	0.01	0.02
		CO	0.04	0.18
		VOC	0.01	0.01
HTR4	T-2 Laminating Adhesive Bulk Storage Tank heater Vent	NO _x	0.05	0.22
		SO ₂	0.01	0.01
		PM	0.01	0.02
		PM ₁₀	0.01	0.02
		PM _{2.5}	0.01	0.02
		CO	0.04	0.18
		VOC	0.01	0.01
HTR5	Asphalt Heater for T-14 and T-15 Coating Asphalt Storage and Coating Feed Loop Vent	NO _x	0.10	0.44
		SO ₂	0.01	0.01
		PM	0.01	0.03
		PM ₁₀	0.01	0.03
		PM _{2.5}	0.01	0.03

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
HTR5	Asphalt Heater for T-14 and T-15 Coating Asphalt Storage and Coating Feed Loop Vent	CO	0.08	0.35
		VOC	0.01	0.02
BLR5	Standby Boiler Vent	NO _x	0.82	3.59
		SO ₂	0.01	0.04
		PM	0.16	0.70
		PM ₁₀	0.16	0.70
		PM _{2.5}	0.16	0.70
		CO	1.73	7.58
		VOC	0.11	0.48
8/8A	Thermal Oxidizer (Direct Flame Incinerator) Exhaust through Waste Heat Boiler Stack	NO _x	1.90	8.31
		SO ₂	29.35	128.55
		PM	2.62	11.46
		PM ₁₀	2.62	11.46
		PM _{2.5}	2.62	11.46
		CO	11.34	49.65
		VOC	0.09	0.37
WHBLR1	Waste Heat Recovery Boiler Natural Gas Burner Side Vent	NO _x	0.47	2.06
		SO ₂	0.01	0.04
		PM	0.11	0.48
		PM ₁₀	0.11	0.48
		PM _{2.5}	0.11	0.48
		CO	1.24	5.43
		VOC	0.08	0.35

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
Common to Line 1 and Line 3				
CFL/34	Coalescing Filter Mist Elimination Systems (Line 1 and Line 3 Asphalt Coaters) with ESP as Backup (Stack)	PM	0.63	2.76
		PM ₁₀	0.63	2.76
		PM _{2.5}	0.63	2.76
		VOC	5.76	25.23
Line 1 Operation				
1-1	Line 1 Stabilizer Storage and Heater Baghouse Stack	PM	0.23	1.01
		PM ₁₀	0.23	1.01
		PM _{2.5}	0.23	1.01
1-3	Line 1 Stabilizer Use Bin Baghouse Stack	PM	0.03	0.13
		PM ₁₀	0.03	0.13
		PM _{2.5}	0.03	0.13
1-4	Line 1 Surfacing Section Dust Collector No. 1 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
1-5	Line 1 Surfacing Section Dust Collector No. 2 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
1-6	Line 1 Surfacing Section Dust Collector No. 3 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
COOL1	Line 1 Cooling Section (3 stacks)	PM	8.52	37.30
		PM ₁₀	8.52	37.30

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
COOL1	Line 1 Cooling Section (3 stacks)	PM _{2.5}	8.52	37.30
		VOC	1.65	7.23
Line 3 Operation				
25	Sand Application Baghouse Stack	PM	1.50	6.57
		PM ₁₀	1.50	6.57
		PM _{2.5}	1.50	6.57
26A	Stabilizer Storage Baghouse A Stack	PM	0.15	0.66
		PM ₁₀	0.15	0.66
		PM _{2.5}	0.15	0.66
26B	Stabilizer Storage Baghouse B Stack	PM	0.29	1.27
		PM ₁₀	0.29	1.27
		PM _{2.5}	0.29	1.27
27	Stabilizer Heater Baghouse Stack	PM	0.09	0.39
		PM ₁₀	0.09	0.39
		PM _{2.5}	0.09	0.39
28	Asphalt Heater Vent	NO _x	0.59	2.58
		SO ₂	<0.01	0.02
		PM	0.04	0.20
		PM ₁₀	0.04	0.20
		PM _{2.5}	0.04	0.20
		CO	0.49	2.15
		VOC	0.03	0.14

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
FUG1	Plant-wide Fugitive Emissions	PM	0.91	3.97
		PM ₁₀	0.91	3.97
		PM _{2.5}	0.91	3.97
		VOC	0.43	1.88
COOL3	Line 3 Cooling Section (3 stacks)	PM	6.74	29.52
		PM ₁₀	6.74	29.52
		PM _{2.5}	6.74	29.52
		VOC	2.76	12.09
HTR6	Line 3 Stabilizer Thermal Fluid Heater Vent	NO _x	0.39	1.71
		SO ₂	0.01	0.01
		PM	0.03	0.13
		PM ₁₀	0.03	0.13
		PM _{2.5}	0.03	0.13
		CO	0.33	1.45
		VOC	0.02	0.09
All Source (site-wide)	Various	Single HAP	--	<10
		Aggregate HAP	--	<25

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.

(2) Specific point source name. For fugitive sources, use area name or fugitive source name.

(3) VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1

NO_x - total oxides of nitrogen

SO₂ - sulfur dioxide

PM - total particulate matter, suspended in the atmosphere, including PM₁₀ and PM_{2.5}, as represented

PM₁₀ - total particulate matter equal to or less than 10 microns in diameter, including PM_{2.5}, as represented

PM_{2.5} - particulate matter equal to or less than 2.5 microns in diameter

CO - carbon monoxide

Emission Sources - Maximum Allowable Emission Rates

HAP - hazardous air pollutant as listed in § 112(b) of the Federal Clean Air Act or Title 40 Code of Federal Regulations Part 63, Subpart C

- (4) Compliance with annual emission limits (tons per year) is based on a 12 month rolling period.
- (5) Planned startup and shutdown emissions are included. Maintenance activities are not authorized by this permit.

Dated: November 25, 2014

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niemann, *Commissioner*
Stephanie Bergeron Perdue, *Interim Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 10, 2018

MR BRUCE DAHLGREN
PLANT MANAGER
BUILDING MATERIALS INVESTMENT CORPORATION
2600 SINGLETON BLVD
DALLAS TX 75212-3738

Re: Permit Alteration
Permit Number: 7711A
Expiration Date: November 25, 2024
Building Materials Investment Corporation
Asphalt Roofing Manufacturing Facility
Dallas, Dallas County
Regulated Entity Number: RN100788959
Customer Reference Number: CN605251487

Dear Mr. Dahlgren:

This is in response to your letter received February 8, 2018, requesting alteration of the Maximum Allowable Emission Rates Table (MAERT) of the above-referenced permit. We understand that this alteration request was to replace the current Sand Application Baghouse with a new, more efficient baghouse; and to relocate the baghouse stack to a new location further away from the nearest property line.

In accordance with Title 30 Texas Administrative Code §116.116(c) and based on our review, Permit Number 7711A is altered. Enclosed are the new general conditions (permit face) and altered MAERT. Please attach these to your permit.

You are reminded that these facilities must be in compliance with all rules and regulations of the Texas Commission on Environmental Quality (TCEQ) and of the U.S. Environmental Protection Agency at all times.

If you need further information or have any questions, please contact Mr. Steven Stump at (512) 239-6107 or write to the Texas Commission on Environmental Quality, Office of Air, Air Permits Division, MC-163, P.O. Box 13087, Austin, Texas 78711-3087.

Mr. Bruce Dahlgren
Page 2
April 10, 2018

Re: Permit Number: 7711A

This action is taken under authority delegated by the Executive Director of TCEQ.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Wilson", with a stylized flourish at the end.

Michael Wilson, P.E., Director
Air Permits Division
Office of Air
Texas Commission on Environmental Quality

Enclosure

cc: Ms. Latha Kambham, Managing Consultant, Trinity Consultants, Dallas
Manager, Air Pollution Control Program, City of Dallas Office of Environmental Quality, Dallas
Air Section Manager, Region 4 - Dallas/Fort Worth

Project Number: 281361



Texas Commission on Environmental Quality Air Quality Permit

A Permit Is Hereby Issued To
Building Materials Investment Corporation
Authorizing the Construction and Operation of
Asphalt Roofing Manufacturing Facility
Located at Dallas, Dallas County, Texas
Latitude 32° 46' 40" Longitude -96° 51' 48"

Permit: 7711A

Revision Date: April 10, 2018

Expiration Date: November 25, 2024

Stephani Engoren Pluhne
For the Commission

1. **Facilities** covered by this permit shall be constructed and operated as specified in the application for the permit. All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. Variations from these representations shall be unlawful unless the permit holder first makes application to the Texas Commission on Environmental Quality (commission) Executive Director to amend this permit in that regard and such amendment is approved. [Title 30 Texas Administrative Code (TAC) Section 116.116 (30 TAC § 116.116)]¹
2. **Voiding of Permit.** A permit or permit amendment is automatically void if the holder fails to begin construction within 18 months of the date of issuance, discontinues construction for more than 18 months prior to completion, or fails to complete construction within a reasonable time. Upon request, the executive director may grant an 18-month extension. Before the extension is granted the permit may be subject to revision based on best available control technology, lowest achievable emission rate, and netting or offsets as applicable. One additional extension of up to 18 months may be granted if the permit holder demonstrates that emissions from the facility will comply with all rules and regulations of the commission, the intent of the Texas Clean Air Act (TCAA), including protection of the public's health and physical property; and (b)(1) the permit holder is a party to litigation not of the permit holder's initiation regarding the issuance of the permit; or (b)(2) the permit holder has spent, or committed to spend, at least 10 percent of the estimated total cost of the project up to a maximum of \$5 million. A permit holder granted an extension under subsection (b)(1) of this section may receive one subsequent extension if the permit holder meets the conditions of subsection (b)(2) of this section. [30 TAC § 116.120]
3. **Construction Progress.** Start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office of the commission not later than 15 working days after occurrence of the event. [30 TAC § 116.115(b)(2)(A)]
4. **Start-up Notification.** The appropriate air program regional office shall be notified prior to the commencement of operations of the facilities authorized by the permit in such a manner that a representative of the commission may be present. The permit holder shall provide a separate notification for the commencement of operations for each unit of phased construction, which may involve a series of units commencing operations at different times. Prior to operation of the facilities authorized by the permit, the permit holder shall identify the source or sources of allowances to be utilized for compliance with Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program). [30 TAC § 116.115(b)(2)(B)]
5. **Sampling Requirements.** If sampling is required, the permit holder shall contact the commission's Office of Compliance and Enforcement prior to sampling to obtain the proper data forms and procedures. All sampling and testing procedures must be approved by the executive director and coordinated with the regional representatives of the commission. The permit holder is also responsible for providing sampling facilities and conducting the sampling operations or contracting with an independent sampling consultant. [30 TAC § 116.115(b)(2)(C)]
6. **Equivalency of Methods.** The permit holder must demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the permit. Alternative methods shall be applied for in writing and must be reviewed and approved by the executive director prior to their use in fulfilling any requirements of the permit. [30 TAC § 116.115(b)(2)(D)]
7. **Recordkeeping.** The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and

operating hours; keep all required records in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application; make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction in a timely manner; comply with any additional recordkeeping requirements specified in special conditions in the permit; and retain information in the file for at least two years following the date that the information or data is obtained. [30 TAC § 116.115(b)(2)(E)]

8. **Maximum Allowable Emission Rates.** The total emissions of air contaminants from any of the sources of emissions must not exceed the values stated on the table attached to the permit entitled "Emission Sources--Maximum Allowable Emission Rates." [30 TAC § 116.115(b)(2)(F)]¹
9. **Maintenance of Emission Control.** The permitted facilities shall not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations. The permit holder shall provide notification in accordance with 30 TAC §101.201, 101.211, and 101.221 of this title (relating to Emissions Event Reporting and Recordkeeping Requirements; Scheduled Maintenance, Startup, and Shutdown Reporting and Recordkeeping Requirements; and Operational Requirements). [30 TAC § 116.115(b)(2)(G)]
10. **Compliance with Rules.** Acceptance of a permit by an applicant constitutes an acknowledgment and agreement that the permit holder will comply with all rules and orders of the commission issued in conformity with the TCAA and the conditions precedent to the granting of the permit. If more than one state or federal rule or regulation or permit condition is applicable, the most stringent limit or condition shall govern and be the standard by which compliance shall be demonstrated. Acceptance includes consent to the entrance of commission employees and agents into the permitted premises at reasonable times to investigate conditions relating to the emission or concentration of air contaminants, including compliance with the permit. [30 TAC § 116.115(b)(2)(H)]
11. **This permit may not be transferred, assigned, or conveyed by the holder except as provided by rule.** [30 TAC § 116.110(e)]
12. **There may be additional special conditions attached to a permit upon issuance or modification of the permit. Such conditions in a permit may be more restrictive than the requirements of Title 30 of the Texas Administrative Code.** [30 TAC § 116.115(c)]
13. **Emissions** from this facility must not cause or contribute to "air pollution" as defined in Texas Health and Safety Code (THSC) §382.003(3) or violate THSC § 382.085. If the executive director determines that such a condition or violation occurs, the holder shall implement additional abatement measures as necessary to control or prevent the condition or violation.
14. **The permit holder shall comply with all the requirements of this permit. Emissions that exceed the limits of this permit are not authorized and are violations of this permit.**¹

¹ Please be advised that the requirements of this provision of the general conditions may not be applicable to greenhouse gas emissions.

Emission Sources - Maximum Allowable Emission Rates

Permit Number 7711A

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
Stillyard Operation				
HTR3	T-1 Laminating Adhesive Bulk Storage Tank Heater Vent	NO _x	0.05	0.22
		SO ₂	0.01	0.01
		PM	0.01	0.02
		PM ₁₀	0.01	0.02
		PM _{2.5}	0.01	0.02
		CO	0.04	0.18
		VOC	0.01	0.01
HTR4	T-2 Laminating Adhesive Bulk Storage Tank heater Vent	NO _x	0.05	0.22
		SO ₂	0.01	0.01
		PM	0.01	0.02
		PM ₁₀	0.01	0.02
		PM _{2.5}	0.01	0.02
		CO	0.04	0.18
		VOC	0.01	0.01
HTR5	Asphalt Heater for T- 14 and T-15 Coating Asphalt Storage and Coating Feed Loop Vent	NO _x	0.10	0.44
		SO ₂	0.01	0.01
		PM	0.01	0.03
		PM ₁₀	0.01	0.03
		PM _{2.5}	0.01	0.03
		CO	0.08	0.35
		VOC	0.01	0.02
BLR5	Standby Boiler Vent	NO _x	0.82	3.59
		SO ₂	0.01	0.04

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
		PM	0.16	0.70
		PM ₁₀	0.16	0.70
		PM _{2.5}	0.16	0.70
		CO	1.73	7.58
		VOC	0.11	0.48
8/8A	Thermal Oxidizer (Direct Flame Incinerator) Exhaust through Waste Heat Boiler Stack	NO _x	1.90	8.31
		SO ₂	29.35	128.55
		PM	2.62	11.46
		PM ₁₀	2.62	11.46
		PM _{2.5}	2.62	11.46
		CO	11.34	49.65
		VOC	0.09	0.37
WHBLR1	Waste Heat Recovery Boiler Natural Gas Burner Side Vent	NO _x	0.47	2.06
		SO ₂	0.01	0.04
		PM	0.11	0.48
		PM ₁₀	0.11	0.48
		PM _{2.5}	0.11	0.48
		CO	1.24	5.43
		VOC	0.08	0.35
Common to Line 1 and Line 3				
CFL/34	Coalescing Filter Mist Elimination Systems (Line 1 and Line 3 Asphalt Coaters) with ESP as Backup (Stack)	PM	0.63	2.76
		PM ₁₀	0.63	2.76
		PM _{2.5}	0.63	2.76
		VOC	5.76	25.23
Line 1 Operation				
1-1	Line 1 Stabilizer Storage and Heater Baghouse Stack	PM	0.23	1.01
		PM ₁₀	0.23	1.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
		PM _{2.5}	0.23	1.01
1-3	Line 1 Stabilizer Use Bin Baghouse Stack	PM	0.03	0.13
		PM ₁₀	0.03	0.13
		PM _{2.5}	0.03	0.13
1-4	Line 1 Surfacing Section Dust Collector No. 1 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
1-5	Line 1 Surfacing Section Dust Collector No. 2 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
1-6	Line 1 Surfacing Section Dust Collector No. 3 Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
COOL1	Line 1 Cooling Section (3 stacks)	PM	8.52	37.30
		PM ₁₀	8.52	37.30
		PM _{2.5}	8.52	37.30
		VOC	1.65	7.23
Line 3 Operation				
25	Sand Application Baghouse Stack	PM	0.59	2.58
		PM ₁₀	0.59	2.58
		PM _{2.5}	0.59	2.58
26A	Stabilizer Storage Baghouse A Stack	PM	0.15	0.66
		PM ₁₀	0.15	0.66
		PM _{2.5}	0.15	0.66
26B	Stabilizer Storage Baghouse B Stack	PM	0.29	1.27
		PM ₁₀	0.29	1.27
		PM _{2.5}	0.29	1.27

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
27	Stabilizer Heater Baghouse Stack	PM	0.09	0.39
		PM ₁₀	0.09	0.39
		PM _{2.5}	0.09	0.39
28	Asphalt Heater Vent	NO _x	0.59	2.58
		SO ₂	<0.01	0.02
		PM	0.04	0.20
		PM ₁₀	0.04	0.20
		PM _{2.5}	0.04	0.20
		CO	0.49	2.15
		VOC	0.03	0.14
FUG1	Plant-wide Fugitive Emissions	PM	0.91	3.97
		PM ₁₀	0.91	3.97
		PM _{2.5}	0.91	3.97
		VOC	0.43	1.88
COOL3	Line 3 Cooling Section (3 stacks)	PM	6.74	29.52
		PM ₁₀	6.74	29.52
		PM _{2.5}	6.74	29.52
		VOC	2.76	12.09
HTR6	Line 3 Stabilizer Thermal Fluid Heater Vent	NO _x	0.39	1.71
		SO ₂	0.01	0.01
		PM	0.03	0.13
		PM ₁₀	0.03	0.13
		PM _{2.5}	0.03	0.13
		CO	0.33	1.45
		VOC	0.02	0.09
All Source (site-	Various	Single HAP	--	<10

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates (5)	
			lbs/hour	TPY (4)
wide)		Aggregate HAP	--	<25

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.

(2) Specific point source name. For fugitive sources, use area name or fugitive source name.

(3) Exempt Solvent - Those carbon compounds or mixtures of carbon compounds used as solvents which have been excluded from the definition of volatile organic compound.

VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1

HRVOC - highly reactive volatile organic compounds as defined in 30 TAC § 115.10

IOC-U - inorganic compounds (unspeciated)

NO_x - total oxides of nitrogen

SO₂ - sulfur dioxide

PM - total particulate matter, suspended in the atmosphere, including PM₁₀ and PM_{2.5}, as represented

PM₁₀ - total particulate matter equal to or less than 10 microns in diameter, including PM_{2.5}, as represented

PM_{2.5} - particulate matter equal to or less than 2.5 microns in diameter

CO - carbon monoxide

HAP - hazardous air pollutant as listed in § 112(b) of the Federal Clean Air Act or Title 40 Code of Federal Regulations Part 63, Subpart C

(4) Compliance with annual emission limits (tons per year) is based on a 12 month rolling period.

(5) Emission rate is an estimate and is enforceable through compliance with the applicable special condition(s) and permit application representations.

Date: April 10, 2018

Steven Stump

From: Joel Stanford
Sent: Friday, April 20, 2018 12:11 PM
To: Latha Kambham; Steven Stump
Cc: Lele Bao
Subject: RE: 7711A - C4 - BUILDING MATERIALS INVESTMENT CORPORATION - 282350

No problem! Let us know if you have any questions or can be of further assistance.

Joel Stanford

Work Leader - Mechanical Team
Air Permits Division
Texas Commission on Environmental Quality
Mail Code: MC-163, PO Box 13087
Austin, Texas 78711-3087
Direct Line: (512) 239-0270
How are we doing? www.tceq.texas.gov/customersurvey

From: Latha Kambham [<mailto:LKambham@trinityconsultants.com>]
Sent: Friday, April 20, 2018 11:58 AM
To: Steven Stump; Joel Stanford
Cc: Lele Bao
Subject: FW: 7711A - C4 - BUILDING MATERIALS INVESTMENT CORPORATION - 282350

Hi Steven and Joel,

We wanted to say thank you for your guidance and quick approval of this project. We really appreciate you understanding the importance of this project for the plant.

Thanks and have a great weekend!
Latha

.....
Latha Kambham, Ph.D.
Managing Consultant

Trinity Consultants
12700 Park Central, Suite 2100 | Dallas, Texas 75251
Office: (972) 661-8100; Cell: (504) 343-4593 | Fax: (972) 385-9203

Email: lkambham@trinityconsultants.com
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----- Forwarded message -----

From: **ElecRsp** <ElecRsp@tceq.texas.gov>

Date: Fri, Apr 20, 2018 at 10:41 AM

Subject: 7711A - C4 - BUILDING MATERIALS INVESTMENT CORPORATION - 282350

To:

Cc: "KEVIN.BUSH@GAF.COM" <KEVIN.BUSH@gaf.com>, Steven Stump

<Steven.Stump@tceq.texas.gov>, "brian.cunningham@dallascityhall.com"

<brian.cunningham@dallascityhall.com>

Please see attached documents.

Texas Commission on Environmental Quality

Air Permits Division

(512) 239-1250

Steven Stump

From: Latha Kambham <LKambham@trinityconsultants.com>
Sent: Tuesday, April 10, 2018 11:55 AM
To: Steven Stump
Cc: Lele Bao
Subject: RE: 7711A - C5 - BUILDING MATERIALS INVESTMENT CORPORATION - 281361

Hi Steven,

Thanks for sending the permits!! We look forward to hearing from you soon on the blowstill replacement.

Thanks,
Latha

.....
Latha Kambham, Ph.D.
Managing Consultant

Trinity Consultants

12700 Park Central, Suite 2100 | Dallas, Texas 75251
Office: (972) 661-8100; Cell: (504) 343-4593 | Fax: (972) 385-9203

Email: lkambham@trinityconsultants.com

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From: Steven Stump [<mailto:Steven.Stump@Tceq.Texas.Gov>]
Sent: Tuesday, April 10, 2018 11:39 AM
To: Latha Kambham <LKambham@trinityconsultants.com>
Subject: FW: 7711A - C5 - BUILDING MATERIALS INVESTMENT CORPORATION - 281361

Hello,

Attached are copies of the baghouse replacement/relocation permit that was mailed out today, I will begin putting the together the folder for the blowstill replacement today.

From: ElecRsp
Sent: Tuesday, April 10, 2018 9:58 AM
Cc: KEVIN.BUSH@GAF.COM; Steven Stump; brian.cunningham@dallascityhall.com
Subject: 7711A - C5 - BUILDING MATERIALS INVESTMENT CORPORATION - 281361

Please see attached documents.

Texas Commission on Environmental Quality
Air Permits Division
(512) 239-1250

Steven Stump

From: Latha Kambham <LKambham@trinityconsultants.com>
Sent: Wednesday, April 04, 2018 11:22 AM
To: Steven Stump
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Thank you, Steven!

I appreciate the details on status and timeline and maybe we can request the management review to be expedited once the blowstill project goes in for approval.

Thanks,
Latha

.....
Latha Kambham, Ph.D.
Managing Consultant

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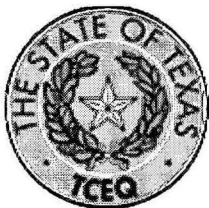
From: Steven Stump [mailto:Steven.Stump@Tceq.Texas.Gov]
Sent: Wednesday, April 04, 2018 11:15 AM
To: Latha Kambham <LKambham@trinityconsultants.com>
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Latha,

The draft permit is out of my hands working its way through the management approval process, I would estimate approval either this Friday or Monday of next week.

And for the blowstill permit, because no new permit documents are being produced I will be submitting that for approval as soon as I get notification that the draft permit has been approved. I would estimate conservatively for the blowstill permit final approval by April 20 at the latest.

Steven Stump, Engineering Specialist
Office of Air | Air Permits Division | NSR
Texas Commission on Environmental Quality
steven.stump@tceq.texas.gov
Work Phone: (512) 239-6107



From: Latha Kambham [<mailto:LKambham@trinityconsultants.com>]
Sent: Wednesday, April 04, 2018 10:57 AM
To: Steven Stump
Cc: Lele Bao
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Steven,

I wanted to check in to see if you have any update on the status of draft permit. Since this affects the blowstill permit, we and the client are getting little concerned about the timeline and I would appreciate your assistance in this matter.

Thanks,
Latha

Latha Kambham, Ph.D.
Managing Consultant

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Email: lkambham@trinityconsultants.com

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Consultants

From: Latha Kambham
Sent: Wednesday, March 28, 2018 11:51 AM
To: 'Steven Stump' <Steven.Stump@Tceq.Texas.Gov>
Cc: Lele Bao <lbao@trinityconsultants.com>
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Steven,

The draft table looks good and we have 2 minor suggestions (formatting) in the attached document. If these can be incorporated prior to submittal for management approval, that would be great!!

Thanks,
Latha

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Email: lkambham@trinityconsultants.com

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From: Steven Stump [<mailto:Steven.Stump@Tceq.Texas.Gov>]

Sent: Tuesday, March 27, 2018 2:53 PM

To: Latha Kambham <LKambham@trinityconsultants.com>

Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Latha,

I have attached a copy of the draft MAERT for your review and approval, I am currently putting together the folder for the Baghouse Replacement project and will be submitting it for approval upon your approval of the MAERT.

For the Blowstill Replacement Project, I will need to wait until the Baghouse Alteration Project is approved before I can submit this project for approval but because the MAERT and Special Conditions are not changing this will be very quick

Best,

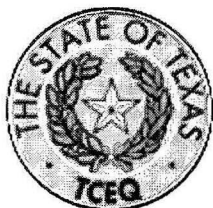
Steven Stump, Engineering Specialist

Office of Air | Air Permits Division | NSR

Texas Commission on Environmental Quality

steven.stump@tceq.texas.gov

Work Phone: (512) 239-6107



From: Latha Kambham [<mailto:LKambham@trinityconsultants.com>]

Sent: Tuesday, March 20, 2018 11:57 AM

To: Steven Stump

Cc: Lele Bao

Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Steven,

Hope you are doing well. We wanted to check on the status of the draft MAERT for this project and also the NSR amendment project for Blowstill replacement.

http://www2.tceq.texas.gov/airperm/index.cfm?fuseaction=airpermits.project_report&proj_id=282350&addn_num_txt=7711A

Thanks,
Latha

.....
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Sent: Tuesday, March 13, 2018 1:48 PM
To: 'Steven Stump' <Steven.Stump@Tceq.Texas.Gov>
Cc: Lele Bao <lbao@trinityconsultants.com>
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Thank you, Steven! It was Monday yesterday. So, we understand and appreciate looking into further and agreeing with our assessment.

We will review the draft permit documents once we receive them and let you know of any comments or changes.

Thanks,
Latha

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Sent: Tuesday, March 13, 2018 1:28 PM
To: Latha Kambham <LKambham@trinityconsultants.com>
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

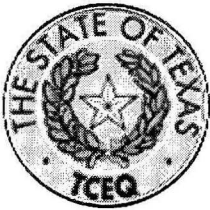
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I was very busy yesterday so I appreciate your patience on this. You are correct, My colleague and I were looking at the wrong data point of the impacts review and assumed the impacts were greater. So you don't need to conduct any additional modeling for this project.

Also, I should have the draft MAERT to you later this afternoon for you to review.

Thanks,

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Texas Commission on Environmental Quality
steven.stump@tceq.texas.gov
Work Phone: (512) 239-6107



From: Latha Kambham [<mailto:LKambham@trinityconsultants.com>]
Sent: Monday, March 12, 2018 2:46 PM
To: Steven Stump
Cc: Lele Bao
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Hi Steven,

I called a couple of times today to discuss this and as I mentioned in the voice mail this morning, the project results in a decrease in emissions as well as impacts. So, can you please let us know why a site-wide modeling is required for the project?

Thanks,
Latha

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From: Steven Stump [<mailto:Steven.Stump@Tceq.Texas.Gov>]

Sent: Monday, March 12, 2018 8:48 AM

To: Latha Kambham <LKambham@trinityconsultants.com>

Subject: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation

Good Morning,

I am the permit reviewer for the subject air permit alteration application. After reviewing the application it has been determined that site-wide modeling for PM10 and PM2.5 is required.

Please provide the requested site-wide modeling by Wednesday, April 11, 2018

If you have any questions or comments regarding this issue feel free to contact me via phone or email.

Best,

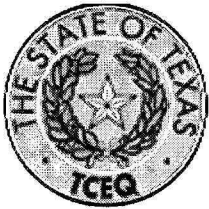
Steven Stump, Engineering Specialist

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steven.stump@tceq.texas.gov

Work Phone: (512) 239-6107



Steven Stump

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Sent: Wednesday, March 28, 2018 11:51 AM
To: Steven Stump
Cc: Lele Bao
Subject: RE: Air Permit #7711A Alteration Application for Baghouse Replacement and Relocation
Attachments: 281361 - Draft Maert_Comments.docx

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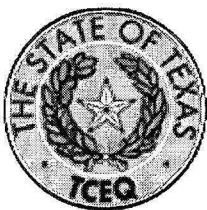
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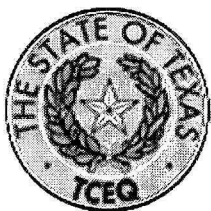
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[Return to Sharenet](#)**02/13/2018 -----NSR IMS - PROJECT RECORD -----**

PROJECT#: 281361 **PERMIT#:** 7711A **STATUS:** PENDING **DISP CODE:** _____
RECEIVED: 02/08/2018 **PROJTYPE:** REVISION **AUTHTYPE:** CONSTRUCT **ISSUED DT:** _____
RENEWAL: 11/25/2024
PROJECT ADMIN NAME: BAGHOUSE REPLACEMENT AND RELOCATION PROJECT
PROJECT TECH NAME: ASPHALT ROOFING MANUFACTURING FACILITY

Assigned Team: MECHANICAL TEAM**STAFF ASSIGNED TO PROJECT:**

HARVILLE , JENNIFER - REVIEWR1_2 - AP INITIAL REVIEW
TEAM LEADER , MECHANICAL - REVIEW ENG - MECHANICAL TEAM

CUSTOMER INFORMATION (OWNER/OPERATOR DATA)

ISSUED TO: BUILDING MATERIALS INVESTMENT CORPORATION
COMPANY NAME: Building Materials Investment Corporation
CUSTOMER REFERENCE NUMBER: **CN605251487**

REGULATED ENTITY/SITE INFORMATION

REGULATED ENTITY NUMBER: **RN100788959** **ACCOUNT:** DB0378S
PERMIT NAME: GAF MATERIALS

REGULATED ENTITY LOCATION: 2600 SINGLETON BLVD
REGION 04 - DFW METROPLEX **NEAR CITY:** DALLAS **COUNTY:** DALLAS

CONTACT DATA

CONTACT NAME: MR KEVIN BUSH **CONTACT ROLE:** RESPONSIBLE OFFICIAL
JOB TITLE: ENVIRONMENTAL ENGINEER **ORGANIZATION:** BUILDING MATERIALS INVESTMENT CORPORATION
MAILING ADDRESS: 2600 SINGLETON BLVD, DALLAS, TX, 75212-3738
PHONE: (214) 637-8933 Ext: 0
FAX: (214) 637-5202 Ext: 0
EMAIL: KBUSH@GAF.COM

CONTACT NAME: MS LATHA KAMBHAM **CONTACT ROLE:** TECHNICAL CONTACT
JOB TITLE: MANAGING CONSULTANT **ORGANIZATION:** TRINITY CONSULTANTS
MAILING ADDRESS: 12700 PARK CENTRAL DR STE 2100, DALLAS, TX, 75251-1546
PHONE: (972) 661-8100 Ext: 0
FAX: (972) 385-9203 Ext: 0
EMAIL: LKAMBHAM@TRINITYCONSULTANTS.COM

PROJECT NOTES:

02/13/2018 SOS 02/13/2018 NO APWL DFC

PERMIT NOTES:

12/09/2009 INCORPORATE STANDARD PERMIT NO. 91414 AT NEXT AMEND. OR RENEWAL
06/15/2017 AS REFERENCED IN 30 TAC § 116.116(D)(2), ALL CHANGES AUTHORIZED UNDER PBR 147140 TO A PERMITTED FACILITY SHALL BE INCORPORATED INTO THE NSR PERMIT NO. 7711A WHEN IT IS AMENDED OR RENEWED.

TRACKING ELEMENTS:

TE Name	Start Date	Complete Date
APIRT RECEIVED PROJECT (DATE)	02/08/2018	
APIRT TRANSFERRED PROJECT TO TECHNICAL STAFF (DATE)	02/13/2018	
CENTRAL REGISTRY UPDATED		
COMPLIANCE HISTORY REVIEW COMPLETED (DATE)		
DEFICIENCY CYCLE		
DRAFT PERMIT RFC SENT TO REGION (DATE)		
EMISSIONS MODELING CYCLE DONE BY APPLICANT		
ENHANCED ADMINISTRATIVE OR APPLICATIONS REVIEW (EAR)		
FINAL PACKAGE REWORK CYCLE		
FINAL PACKAGE TO SECTION MANAGER FOR REVIEW (DATE)		
FINAL PACKAGE TO TEAM LEADER OR SUPERVISOR FOR REVIEW (DATE)		
MODELING AUDIT CYCLE		
PROJECT RECEIVED BY ENGINEER (DATE)		
PROJECT RECEIVED BY TECHNICAL STAFF FROM APIRT (DATE)		
WORKING DRAFT PERMIT REVIEW CYCLE		
WPO FINAL PACKAGE CYCLE		

Permit Unit Type:

ATTACHMENT 1
Emission Calculations

Emission Calculations for the Sand Application Baghouse (EPN: 25)

FIN No.	EPN No.	Description	Flow Rate ¹ (acfm)	Grain Loading ¹ (gr/dscf)	Actual Temperature ^{1,2}		Standard Temperature		PM/PM ₁₀ /PM _{2.5} Emissions ³	
					(°F)	(°R)	(°F)	(°R)	(lb/hr) ⁴	(tpy) ⁵
25	25	Sand Application Baghouse	35,000	0.002	75	535	68	528	0.59	2.58
Currently Permitted Emissions ⁶									1.50	6.57
Emission Changes									-0.91	-3.99

1. Information provided by GAF.

2. The stack temperature is similar to the ambient temperature, which is the average monthly temperature for the Dallas-Fort Worth area obtained from TANKS 4.0.9d database. While the temperature could go up to 100 °F in summer, calculated emissions are higher at 75 °F than at 100 °F.

3. PM₁₀ and PM_{2.5} emission rates are conservatively assumed to be the same as the PM emission rate.

4. Hourly emissions are calculated using the following equation:

$$\text{Hourly Emissions (lb/hr)} = \frac{\text{Maximum Air Flowrate (acfm)} \times \text{Grain Loading (gr/dscf)} \times \text{Standard Temperature (°R)}}{\text{Actual Temperature (°R)} \times \text{(lb/7,000 grains)} \times \text{(60 min/hr)}}$$

$$\text{Hourly Emissions (lb/hr)} = \frac{35,000 \text{ acf} \times 0.002 \text{ gr} \times 528 \text{ deg R}}{\text{min} \times \text{dscf} \times 535 \text{ deg R} \times 7,000 \text{ gr} \times \text{hr}} = \frac{0.59 \text{ lb}}{\text{hr}}$$

5. Annual emissions are calculated using the following equation:

$$\text{Annual Emissions (tpy)} = \text{Hourly Emissions (lb/hr)} \times (8,760 \text{ hr/yr}) \times (\text{ton}/2,000 \text{ lb})$$

$$\text{Annual Emissions (tpy)} = \frac{0.59 \text{ lb}}{\text{hr}} \times \frac{8,760 \text{ hr}}{\text{yr}} \times \frac{\text{ton}}{2,000 \text{ lb}} = \frac{2.58 \text{ tons}}{\text{yr}}$$

6. NSR Permit No. 7711A, issued on November 24, 2014.

ATTACHMENT 2

Table 1(a)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	February 2018	Permit No.:	7711A	Regulated Entity No.:	100788959
Area Name:	Building Materials Investment Corporation - Dallas Facility			Customer Reference No.:	605251487

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA					
1. Emission Point			2. Component of Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		Pounds per Hour (A)	TPY (B)
25	25	Sand Application Baghouse	PM	0.59	2.58
			PM ₁₀	0.59	2.58
			PM _{2.5}	0.59	2.58

EPN = Emission Point Number

FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date	February 2018	Permit No.:	7711A	Regulated Entity No.:	100788959
Area Name:	Building Materials Investment Corporation - Dallas Facility			Customer Reference No.:	605251487

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this table

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS							
1. Emission Point			4. UTM Coordinates of Emission Point			5. Building Height (Feet)	6. Height Above Ground (Feet)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Feet)	(B) Velocity (fps)	(C) Temperature (°F)	(A) Length (F)	(B) Width (Ft)	(C) Axis Degrees
25	25	Sand Application Baghouse	14	700,175	3,628,520		60	3.58	57.84	75- 100			

EPN = Emission Point Number

FIN = Facility Identification Number

TCEQ-10153 [Revised 04/08] Table 1(a)

This form is for use by sources subject to air quality permit requirements and may be revised periodically. [APDG 5178 v5]

ATTACHMENT 3
Screening Analysis

SCREEN 3 Modeled Ground Level Concentrations with a Unit Emission Rate ($\mu\text{g}/\text{m}^3$)

Model ID	Represented	Source	Release Height		Diameter		Flow Rate	Velocity		Temperature		GLC _{max} Unit Emission Rate Run	Distance to Nearest Property Line
												Hourly	
	Sources	Type	ft	m	ft	m	cfm	ft/s	m/s	F	K	($\mu\text{g}/\text{m}^3$) / (lb/hr)	m
25_OLD	Current Location	POINT SOURCE	61.23	18.66	3.90	1.19	30,000	25.23	7.69	100	310.93	14.97	22
25	Proposed Location	POINT SOURCE	60.00	18.29	3.58	1.09	35,000	27.25	8.31	75	297.04	22.80	35

SCREEN 3 Modeled Ground Level Concentrations

EPN	Represented	Source	PM/PM ₁₀ /PM _{2.5} Emissions		GLC _{max} ($\mu\text{g}/\text{m}^3$) ¹	
			lb/hr	tpy	Hourly	Annual
25	Current Location	POINT SOURCE	1.50	6.57	22.46	1.80
25	Proposed Location	POINT SOURCE	0.59	2.58	13.45	1.07
GLC _{max} Changes					-9.00	-0.72

1. Unit emission rate GLC_{max} times emission rate. Per Appendix B *Screening Factors and Ratio Techniques* of the TCEQ's Air Quality Modeling Guidelines RG-25 (Revised) dated February 1999, GLC_{max} from SCREEN3 is multiplied by a conversion factor of 0.08 to convert from the 1-hour averaging period to annual averaging period. The hourly emission rates used for the annual averaging period are based on annual emissions increase (tpy) * 2000 lb/ton / 8760 hours/yr.

Building Downwash Information (Building 18)

Downwash Building Height	Min. Horizontal Building Dimension	Max. Horizontal Building Dimension
(m)	(m)	(m)
10.82	37.5	141

02/01/18
14:05:11

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 0.126000
STACK HEIGHT (M) = 18.6600
STK INSIDE DIAM (M) = 1.1900
STK EXIT VELOCITY (M/S)= 7.6900
STK GAS EXIT TEMP (K) = 310.9300
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = 10.8200
MIN HORIZ BLDG DIM (M) = 37.5000
MAX HORIZ BLDG DIM (M) = 141.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 1.539 M**4/S**3; MOM. FLUX = 19.728 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	U10M STAB	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
22.	0.9159E-10	1	2.0	2.1	640.0	32.83	7.36	4.27 NO
35.	8.644	6	4.0	5.6	10000.0	22.18	1.89	7.82 HS
40.	9.829	6	4.0	5.6	10000.0	22.35	2.08	8.16 HS
50.	11.69	6	4.0	5.6	10000.0	22.78	2.49	8.84 HS
60.	12.70	6	4.0	5.6	10000.0	23.36	2.91	9.53 HS
70.	13.54	6	4.0	5.6	10000.0	23.90	3.33	10.21 HS
80.	14.19	6	4.0	5.6	10000.0	24.42	3.74	10.90 HS
90.	14.66	6	4.0	5.6	10000.0	24.92	4.14	11.58 HS
100.	14.97	6	4.0	5.6	10000.0	25.40	4.54	12.27 HS
150.	11.32	4	3.5	3.8	1120.0	26.36	12.13	14.48 HS
200.	10.93	4	3.0	3.3	960.0	27.65	15.77	16.07 HS
250.	10.63	4	2.5	2.7	800.0	29.45	19.36	17.65 HS
300.	10.23	4	2.5	2.7	800.0	29.45	22.82	19.12 HS
350.	9.712	4	2.5	2.7	800.0	29.45	26.24	20.56 HS
400.	9.149	4	2.5	2.7	800.0	29.45	29.62	21.98 HS

500.	8.020	4	2.5	2.7	800.0	29.45	36.28	24.76	HS
600.	7.295	3	1.0	1.1	320.0	46.48	65.19	39.14	NO
700.	6.595	4	1.5	1.6	480.0	36.64	49.46	24.58	NO
800.	6.489	4	1.5	1.6	480.0	36.64	55.81	27.27	NO
900.	6.261	4	1.0	1.1	320.0	45.63	62.36	30.46	NO
1000.	6.208	4	1.0	1.1	320.0	45.63	68.56	33.00	NO
1500.	4.884	4	1.0	1.1	320.0	45.63	98.84	42.38	NO
2000.	3.748	4	1.0	1.1	320.0	45.63	128.18	50.74	NO
3000.	3.185	6	1.0	1.4	10000.0	44.06	92.21	27.94	NO
5000.	2.523	6	1.0	1.4	10000.0	44.06	145.85	34.97	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, $X < 3 \cdot LB$

*** REGULATORY (Default) ***

PERFORMING CAVITY CALCULATIONS
 WITH ORIGINAL SCREEN CAVITY MODEL
 (BRODE, 1988)

*** CAVITY CALCULATION - 1 *** *** CAVITY CALCULATION - 2 ***

CONC (UG/M**3) = 0.000	CONC (UG/M**3) = 0.000
CRIT WS @10M (M/S) = 99.99	CRIT WS @10M (M/S) = 99.99
CRIT WS @ HS (M/S) = 99.99	CRIT WS @ HS (M/S) = 99.99
DILUTION WS (M/S) = 99.99	DILUTION WS (M/S) = 99.99
CAVITY HT (M) = 11.01	CAVITY HT (M) = 10.82
CAVITY LENGTH (M) = 57.95	CAVITY LENGTH (M) = 35.16
ALONGWIND DIM (M) = 37.50	ALONGWIND DIM (M) = 141.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

END OF CAVITY CALCULATIONS

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN	14.97	100.	0.
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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

02/01/18
14:05:12

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 0.126000
STACK HEIGHT (M) = 18.2900
STK INSIDE DIAM (M) = 1.0900
STK EXIT VELOCITY (M/S) = 8.3100
STK GAS EXIT TEMP (K) = 297.0400
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = 10.8200
MIN HORIZ BLDG DIM (M) = 37.5000
MAX HORIZ BLDG DIM (M) = 141.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.329 M**4/S**3; MOM. FLUX = 20.232 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	U10M STAB	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	SIGMA DWASH
22.	0.3169E-08	1	1.0	1.0	320.0	44.34	8.57	6.13 NO
35.	8.673	4	10.0	10.9	3200.0	18.54	3.14	7.76 HS
40.	9.315	6	4.0	5.6	10000.0	22.52	2.12	8.17 HS
50.	11.60	6	4.0	5.6	10000.0	22.84	2.50	8.85 HS
60.	13.75	6	4.0	5.6	10000.0	23.11	2.89	9.52 HS
70.	16.50	6	4.0	5.6	10000.0	23.14	3.24	10.18 HS
80.	18.98	6	4.0	5.6	10000.0	23.14	3.59	10.85 HS
90.	21.01	6	4.0	5.6	10000.0	23.14	3.94	11.51 HS
100.	22.80	6	3.5	4.9	10000.0	23.86	4.37	12.20 HS
150.	18.53	6	3.0	4.2	10000.0	25.75	6.30	13.56 HS
200.	13.08	6	3.5	4.9	10000.0	26.03	8.04	14.05 HS
250.	11.93	4	2.5	2.7	800.0	28.22	19.33	17.61 HS
300.	11.29	4	2.5	2.7	800.0	28.22	22.79	19.08 HS
350.	10.59	4	2.5	2.7	800.0	28.22	26.21	20.52 HS
400.	9.873	4	2.5	2.7	800.0	28.22	29.59	21.95 HS

500.	8.997	6	2.0	2.8	10000.0	30.39	18.30	16.71	HS
600.	8.442	6	2.0	2.8	10000.0	30.39	21.52	17.48	HS
700.	7.970	6	2.0	2.8	10000.0	30.39	24.70	18.24	HS
800.	7.554	6	2.0	2.8	10000.0	30.39	27.85	18.98	HS
900.	7.178	6	2.0	2.8	10000.0	30.39	30.97	19.71	HS
1000.	6.959	5	1.0	1.2	10000.0	37.42	51.23	22.31	NO
1500.	6.505	5	1.0	1.2	10000.0	37.42	73.90	28.46	NO
2000.	6.436	6	1.0	1.4	10000.0	33.54	63.82	22.06	NO
3000.	5.388	6	1.0	1.4	10000.0	33.54	92.03	27.33	NO
5000.	3.568	6	1.0	1.4	10000.0	33.54	145.74	34.48	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, $X < 3 \cdot LB$

*** REGULATORY (Default) ***

PERFORMING CAVITY CALCULATIONS
 WITH ORIGINAL SCREEN CAVITY MODEL
 (BRODE, 1988)

*** CAVITY CALCULATION - 1 *** *** CAVITY CALCULATION - 2 ***

CONC (UG/M**3) = 0.000	CONC (UG/M**3) = 0.000
CRIT WS @10M (M/S) = 99.99	CRIT WS @10M (M/S) = 99.99
CRIT WS @ HS (M/S) = 99.99	CRIT WS @ HS (M/S) = 99.99
DILUTION WS (M/S) = 99.99	DILUTION WS (M/S) = 99.99
CAVITY HT (M) = 11.01	CAVITY HT (M) = 10.82
CAVITY LENGTH (M) = 57.95	CAVITY LENGTH (M) = 35.16
ALONGWIND DIM (M) = 37.50	ALONGWIND DIM (M) = 141.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

END OF CAVITY CALCULATIONS

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN	22.80	100.	0.
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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
